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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER
BLACKWELL, JAMES H

ART UNIT	PAPER NUMBER
2176	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/679,154	SIMSKE ET AL.	
	Examiner	Art Unit	
	James H. Blackwell	2176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 June 2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-48 and 50-65 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-48 and 50-65 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to an amendment filed 06/26/2006 with a priority date of **10/03/2003**.

2. Claims 1-48, and 50-65 are currently pending. Claims 1, 22, and 48 are independent claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 48, and 50 remain rejected under 35 U.S.C. 102(b) as being anticipated by Yamashita et al. (hereinafter Yamashita, U.S. Patent No. 5,555,362 filed 07/26/1995, issued 09/10/1996).

In regard to independent Claim 1 (and similarly independent Claim 48), Yamashita teaches *receiving a definition of at least one region in an image* in that a document image is scanned by the image input unit (2), and character strings, vertical and horizontal black lines, and other black pixel regions (picture-element) are extracted from the image and stored in the image memory 3 (Step 21) (Col. 3, lines 35-40).

Yamashita also teaches *the region definition having a location specification and a type specification* in that subsequent processing is executed in accordance with extracted rectangle data. Then, area segmentation of the document image is

automatically executed by the automatic area segmentation unit 4A of the area generation unit 4 (Step.22). First, long, wide, and White pixel regions (type specification) and long black lines (type specification) to serve as separators for objects are extracted from the x,y-coordinates of the rectangle (position). Then, graphic areas (type specification) are removed before character areas (type specification) are roughly segmented using the extracted separator (Col. 3, lines 41-49).

Yamashita also teaches *displaying the boundaries of the at least one defined region according to its type specification* (see Fig. 3).

Yamashita also teaches *receiving a definition of a visible area in the image, the visible area definition having a specification of margins around the image; and generating an image layout definition comprising the region definition and the visible area definition* (see Fig 6, layout created from segmentation analysis of image positions and components).

In regard to dependent Claim 2, Yamashita teaches *displaying the image on a display* (Col. 3, lines 53-59; Fig. 6).

In regard to dependent Claim 4 (and similarly independent Claim 50), Yamashita teaches *automatically determining the definition of the at least one region in the image by segmentation analysis of the image* (see Figs. 2 and 3, Fig. 2 step 22).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 12-14, and 58-60 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita.

In regard to dependent Claim 12-14 (and similarly dependent Claims 58-60), Yamashita fails to teach *such limitations for manipulating scanned document images for purposes of displaying or transmitting in order to provide an image that is the appropriate size, dimension, color depth for the given action.* However, such functions were known and obvious to one of ordinary skill in the art at the time of invention particularly with respect to graphical user interfaces where one would have desired to view entire images on a screen independent of the size of the actual image for purposes such as identifying regions of interest.

7. Claims 3, 11, 17, and 57 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Revankar et al. (hereinafter Revankar, U.S. Patent No. 5,767,978 filed 01/21/1997, issued 06/16/1998).

In regard to dependent Claim 3, Yamashita fails to teach *receiving a definition of at least one region in an image further comprises receiving a modality specification.* However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 11 (and similarly dependent Claim 57), Yamashita fails to teach *receiving a user input indicative of a first vertex and a location of a second vertex opposite the first vertex of the visible area on the image.* However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered

according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 17, Yamashita fails to teach *receiving user specification of region type and region modality*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

8. Claims 5, and 51 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Sakai et al. (hereinafter Sakai, U.S. Patent No. 6,735,740 filed 03/04/1998, issued 05/11/2004).

In regard to dependent Claim 5 (and similarly independent Claim 51), Yamashita fails to teach *automatically determining the definition of the at least one region in the image by classification analysis of the image*. However, Sakai teaches such a limitation (Figs. 10A-C; depict progressive classification of image regions based on type). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Sakai as both inventions relate to document image analysis. Adding the teaching of Sakai provides the benefit of partitioning an image based on types of content identified in the image.

9. Claims 6, and 52 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Ohta (U.S. Patent No. 6,163,623 filed 07/26/1995, issued 12/19/2000).

In regard to dependent Claim 6 (and similarly dependent Claim 52), Yamashita fails to teach *receiving a user input indicative of a point on the image; and*

defining a region encompassing the point using segmentation and classification analyses of the image. However, Ohta teaches scanning a document, rendering it to a touch display, and allowing the user to manually select a region or regions to further process; the drawing of a box is done automatically (Col. 7, lines 46-67; Col. 8, lines 1-2). It would have been obvious to one of ordinary skill in the art at the time of invention

to combine the teachings of Yamashita and Ohta as both inventions relate to designating regions of documents for further analysis. Adding the teaching of Ohta provides the user with a means to easily choose which portions of a document to further analyze.

10. Claims 7, 15, and 53 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan (U.S. Patent No. 5,822,454 filed 04/10/1995, issued 10/13/1998).

In regard to dependent Claim 7 (and similarly dependent Claim 53), Yamashita fails to teach r*eceiving a user input indicative of boundaries of the region on the image; and receiving a user input indicative of region type and region modality specifications*. However, Rangarajan teaches a conventional set of drawing-like tools with which the user can graphically create 311 the user defined zones. This is done by choosing an appropriate drawing tool, such as a rectangle or polygon creation tool, and applying it to the de-skewed image to select the individual areas or zones containing the desired text information. Fig. 7a illustrates one example of a suitable user interface 705, showing a de-skewed document 700. Fig. 7b illustrates the same document now including a number of user-defined zones 701. A palette of drawing tools 703 is also shown, with various graphical tools for selecting the user-defined zones 701. Once the user defines a number of zones, the coordinates of the boundary of each of user defined zone is stored, preferably using the coordinates of an upper left hand corner, and a lower right hand corner where the user defined zone is a rectangle. For general

polygonal user defined zones, the coordinates of each vertex may also be stored (Col. 9, lines 15-37; Figs. 7A-B). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

In regard to dependent Claim 15, Yamashita fails to teach r*eceiving definition of at least one region comprises receiving a user specification of a location and boundaries of a region in the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37; inputting polygons). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

11. Claims 8-10, and 54-56 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan, and in further view of Revankar.

In regard to dependent Claim 8 (and similarly dependent Claim 54), Yamashita fails to teach *receiving a user input indicative of vertices of the region on the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 9 (and similarly dependent Claim 55), Yamashita teaches *receiving a user input indicative of vertices of a polygonal region on the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications of the polygonal region*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 10 (and similarly dependent Claim 56), Yamashita fails to teach *receiving a user input indicative of a first vertex and a location*

of a second vertex opposite the first vertex of a rectangular region on the image. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications of the rectangular region.* However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

12. Claims 16, 20, 61, and 64 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan, and in further view of Mahoney et al. (hereinafter Mahoney, U.S. Patent No. 5,999,664 filed 11/14/1997, issued 12/07/1999).

In regard to dependent Claim 16, Yamashita teaches *receiving definition of at least one region comprises verifying the user-specified region location and boundaries conform to at least one region management model.* However, Mahoney teaches searching and identifying documents based on their makeup (structure, content, etc.). Their system performs structural analysis at two levels. At the lower level, specific layout formats of a document can be identified (e.g., the recipient field of a letter or the header field of a memo). Such identification is performed herein using features. At the higher level, the entire configuration of an input document is captured using genre models. For example, a "business letter" is a genre model of a document that can be defined in most instances by a letter-date feature, a letter-recipient feature, a letter-cc feature, and a letter-signature feature (as shown in Fig. 3). Although some models may have some features in common, such models may still be distinguishable from each other by either the presence or absence of other features. For example, a memo and a letter may have similar letter-signature features while each may have different document header features (e.g., four-memo mark and letter-recipient) (Col. 20, lines 45-62).. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to

comparing document images to models or templates of documents. Adding the teaching of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

In regard to dependent Claim 20 (and similarly dependent Claim 64), Yamashita fails to teach *determining whether the user-specified region boundaries fall within the visible area*. However, Mahoney teaches searching and identifying documents based on their makeup (structure, content, etc.). Their system performs structural analysis at two levels. At the lower level, specific layout formats of a document can be identified (e.g., the recipient field of a letter or the header field of a memo). Such identification is performed herein using features. At the higher level, the entire configuration of an input document is captured using genre models. For example, a "business letter" is a genre model of a document that can be defined in most instances by a letter-date feature, a letter-recipient feature, a letter-cc feature, and a letter-signature feature (as shown in Fig. 3). Although some models may have some features in common, such models may still be distinguishable from each other by either the presence or absence of other features. For example, a memo and a letter may have similar letter-signature features while each may have different document header features (e.g., four-memo mark and letter-recipient) (Col. 20, lines 45-62). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to comparing document images to models or templates of documents. Adding the teaching of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

In regard to dependent Claim 61, Claim 61 contains subject matter similar to that found in Claims 15 and 16, and is rejected along similar lines of reasoning.

13. Claims 18-19, 62-63 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan, and in further view of Mahoney, and in further view of Taylor et al. (hereinafter Taylor, U.S. Patent No. 5,848,184 filed 06/30/1995, issued 12/08/1998).

In regard to dependent Claim 18-19 (and similarly dependent Claims 62-63), Yamashita fails to teach *determining whether the user-specified region boundaries overlap with another region*. However, Taylor teaches detection of overlapping boundaries as well as bounding boxes, which cross one another (Col. 7, lines 36-63).

14. Claims 21, and 65 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan, and in further view of Ahlstrom et al. (hereinafter Ahlstrom, U.S. Patent No. 6,594,030 filed 08/27/1999, issued 07/15/2003).

In regard to dependent Claim 21 (and similarly dependent Claims 42, and 65), Yamashita fails to teach *determining whether the user-specified region comply with a predetermined multiple z-order specification*. However, Ahlstrom teaches z-order as it relates to how pages are overlapped upon one another (Col. 6, lines 23-56). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Ahlstrom as both inventions relate to analysis of page

objects. Adding the teaching of Ahlstrom provides the benefit of checking z-ordering of pages.

15. Claims 22-24, 33-35, and 43-47 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney.

In regard to independent Claim 22, Claim 22 reflects the method of Claim 1 and is rejected along the same rationale.

In addition, Yamashita fails to teach *searching for an image layout definition template that best matches the generated image layout definition; and conforming the generated image layout definition to the best-matched image layout definition template*. However, Mahoney teaches searching and identifying documents based on their makeup (structure, content, etc.). Their system performs structural analysis at two levels. At the lower level, specific layout formats of a document can be identified (e.g., the recipient field of a letter or the header field of a memo). Such identification is performed herein using features. At the higher level, the entire configuration of an input document is captured using genre models. For example, a "business letter" is a genre model of a document that can be defined in most instances by a letter-date feature, a letter-recipient feature, a letter-cc feature, and a letter-signature feature (as shown in Fig. 3). Although some models may have some features in common, such models may still be distinguishable from each other by either the presence or absence of other features. For example, a memo and a letter may have similar letter-signature features while each may have different document header features (e.g., four-memo mark and

letter-recipient) (Col. 20, lines 45-62). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to comparing document images to models or templates of documents. Adding the teaching of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

In regard to dependent Claim 23, Yamashita teaches *displaying the image on a display* (Col. 3, lines 53-59; Fig. 6).

In regard to dependent Claim 24, Claim 24 reflects the method as claimed in Claim 1 (and similarly Claim 48), and is rejected along the same rationale.

In regard to dependent Claims 33-35, Yamashita fails to teach such limitations for manipulating scanned document images for purposes of displaying or transmitting in order to provide an image that is the appropriate size, dimension, color depth for the given action. However, such functions were known and obvious to one of ordinary skill in the art at the time of invention particularly with respect to graphical user interfaces where one would have desired to view entire images on a screen independent of the size of the actual image for purposes such as identifying regions of interest.

In regard to dependent Claims 43-45, and 47, Yamashita fails to explicitly teach *adjusting the location, type, modality, or visible area specification of the at least one region of the image layout definition*. However Mahoney teaches a document search system provides a user with a programming interface for dynamically specifying features of documents recorded in a corpus of documents (Abstract). Mahoney provides a user interface which allows for the definition or adjustment of a given documents'

parameters in order to search a corpus of documents looking for similarities. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to use the user interface of Mahoney to make adjustments in the model of a current document to make identification of all or a part of similar documents more likely. It also would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to comparing document images to models or templates of documents. Adding the teaching of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

In regard to dependent Claim 46, Claim 46 contains subject matter similar to that found in Claim 1 (and similarly Claim 48), and is rejected along similar lines of reasoning.

16. Claims 25 and 32 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Revankar.

In regard to dependent Claim 25, Yamashita fails to teach *receiving a definition of at least one region in an image further comprises receiving a modality specification.* However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half

toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 32, Yamashita fails to teach *receiving a user input indicative of a first vertex and a location of a second vertex opposite the first vertex of the visible area on the image*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

17. Claim 26 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Sakai.

In regard to dependent Claim 26, Claim 26 reflects the method of Claims 4 and 5 and is rejected along the same rationale.

18. Claim 27 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Ohta.

In regard to dependent Claim 27, Yamashita fails to teach *receiving a user input indicative of a point on the image; and defining a region encompassing the point using segmentation and classification analyses of the image*. However, Ohta teaches scanning a document, rendering it to a touch display, and allowing the user to manually select a region or regions to further process; the drawing of a box is done automatically (Col. 7, lines 46-67; Col. 8, lines 1-2). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Ohta as both inventions relate to designating regions of documents for further analysis. Adding the teaching of Ohta provides the user with a means to easily choose which portions of a document to further analyze.

19. Claims 28, 36-37, and 41 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Rangarajan.

In regard to dependent Claim 28, Yamashita fails to teach *receiving a user input indicative of boundaries of the region on the image; and receiving a user input indicative of region type and region modality specifications*. However, Rangarajan teaches a conventional set of drawing-like tools with which the user can graphically create 311 the user defined zones. This is done by choosing an appropriate drawing tool, such as a rectangle or polygon creation tool, and applying it to the de-skewed image to select the individual areas or zones containing the desired text information. Fig. 7a illustrates one example of a suitable user interface 705, showing a de-skewed document 700. Fig. 7b illustrates the same document now including a number of user-defined zones 701. A palette of drawing tools 703 is also shown, with various graphical tools for selecting the user-defined zones 701. Once the user defines a number of zones, the coordinates of the boundary of each of user defined zone is stored, preferably using the coordinates of an upper left hand corner, and a lower right hand corner where the user defined zone is a rectangle. For general polygonal user defined zones, the coordinates of each vertex may also be stored (Col. 9, lines 15-37; Figs. 7A-B). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

In regard to dependent Claim 36, Yamashita fails to teach *receiving definition of at least one region comprises receiving a user specification of a location and boundaries of a region in the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

In regard to dependent Claim 37, Yamashita teaches *receiving definition of at least one region comprises verifying the user-specified region location and boundaries conform to at least one region management model*. However, Mahoney teaches searching and identifying documents based on their makeup (structure, content, etc.). Their system performs structural analysis at two levels. At the lower level, specific layout formats of a document can be identified (e.g., the recipient field of a letter or the header field of a memo). Such identification is performed herein using features. At the higher level, the entire configuration of an input document is captured using genre models. For example, a "business letter" is a genre model of a document that can be defined in most instances by a letter-date feature, a letter-recipient feature, a letter-cc feature, and a letter-signature feature (as shown in Fig. 3). Although some models may have some features in common, such models may still be distinguishable from each other by either the presence or absence of other features. For example, a memo and a letter may have similar letter-signature features while each may have different document header features (e.g., four-memo mark and letter-recipient) (Col. 20, lines 45-

62). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to comparing document images to models or templates of documents. Adding the teaching of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

In regard to dependent Claim 41, Yamashita fails to teach *determining whether the user-specified region boundaries fall within the visible area.* However, Mahoney teaches searching and identifying documents based on their makeup (structure, content, etc.). Their system performs structural analysis at two levels. At the lower level, specific layout formats of a document can be identified (e.g., the recipient field of a letter or the header field of a memo). Such identification is performed herein using features. At the higher level, the entire configuration of an input document is captured using genre models. For example, a "business letter" is a genre model of a document that can be defined in most instances by a letter-date feature, a letter-recipient feature, a letter-cc feature, and a letter-signature feature (as shown in Fig. 3). Although some models may have some features in common, such models may still be distinguishable from each other by either the presence or absence of other features. For example, a memo and a letter may have similar letter-signature features while each may have different document header features (e.g., four-memo mark and letter-recipient) (Col. 20, lines 45-62). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Mahoney as both inventions relate to comparing document images to models or templates of documents. Adding the teaching

of Mahoney provides the benefit of identifying documents (or regions thereof) with layout models.

20. Claims 29-31, and 38 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Rangarajan, and in further view of Revankar.

In regard to dependent Claim 29, Yamashita fails to teach *receiving a user input indicative of vertices of the region on the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions

relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 30, Yamashita teaches *receiving a user input indicative of vertices of a polygonal region on the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications of the polygonal region*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 31, Yamashita fails to teach *receiving a user input indicative of a first vertex and a location of a second vertex opposite the first vertex of a rectangular region on the image*. However, Rangarajan teaches input of vertices to define an image region (Col. 9, lines 15-37). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Rangarajan as both inventions relate to document image analysis. Adding the teaching of Rangarajan provides the benefit of manually defining image regions.

Yamashita also fails to teach *receiving a user input indicative of region type and region modality specifications of the rectangular region*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

In regard to dependent Claim 38, Yamashita fails to teach *receiving user specification of region type and region modality*. However, Revankar teaches image segmentation according to classes of regions that may be rendered according to the same imaging techniques. Image regions may be rendered according to a three-class system (such as traditional text, graphic and picture systems), or according to more than three image classes. In addition, only two image classes may be required to render high quality draft or final output images. The image characteristics that may be rendered differently from class to class may include half toning, colorization and other image attributes (see Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Revankar as both inventions relate to image segmentation. Adding the teaching of Revankar provides the benefit of recognizing region types by class and by modality (color, bit depth, etc.).

21. Claims 39-40 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Rangarajan, and in further view of Taylor.

In regard to dependent Claim 39-40, Yamashita fails to teach *determining whether the user-specified region boundaries overlap with another region*. However, Taylor teaches detection of overlapping boundaries as well as bounding boxes, which cross one another (Col. 7, lines 36-63).

22. Claim 42 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita in view of Mahoney, and in further view of Rangarajan, and in further view of Ahlstrom.

In regard to dependent Claim 42, Yamashita fails to teach *determining whether the user-specified region comply with a predetermined multiple z-order specification.* However, Ahlstrom teaches z-order as it relates to how pages are overlapped upon one another (Col. 6, lines 23-56). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Yamashita and Ahlstrom as both inventions relate to analysis of page objects. Adding the teaching of Ahlstrom provides the benefit of checking z-ordering of pages.

Response to Arguments

23. Applicants argue that the prior art of Yamashita does not disclose or even suggest the limitation of Claim 1 (and as amended, similarly Claim 48) of receiving a definition of a visible area in the image, the visible area definition having a specification of margins around the image. The Examiner respectfully disagrees. Yamashita does indeed disclose this limitation in that the visible area(s) in Yamashita are clearly defined by margins surrounding each of the segmented areas (Figs. 3, 16, 17, 20; depict margins surrounding visible areas of the page, the margins define the segments). These segmented areas are then used to produce a model of the document layout.

24. Applicant further argues that the prior art of Mahoney in combination with Yamashita fails to disclose the limitation of Claim 22 of conforming the generated image layout definition to the best-matched image layout definition template. The Examiner respectfully disagrees. Mahoney allows a user to define a model layout and to then query a corpus of documents looking for those with similar layouts. Mahoney was introduced to cover the limitations of searching for and finding the best match between the layout model and existing layouts identified in a document corpus.

25. Further, Applicants respectfully submit that there is no motivation or suggestion to combine the purported teachings of Mahoney with Yamashita as proposed by the Examiner. For example, in the Office Action, as a basis for combining the purported teachings of Mahoney with Yamashita, the Examiner states that it provides the benefit of identifying documents (or regions thereof) with models (Office Action, page 17). As discussed above in connection with the rejection under 35 U.S.C. § 102 of independent

Claims 1 and 48, the Examiner appears to indicate that Yamashita already discloses identifying and/or defining regions in an image (Office Action, pages 2 and 3). Thus, there appears to be no motivation or suggestion to combine the purported teachings of Mahoney with Yamashita at least because, at least according to the Examiner, Yamashita appears to already disclose what the Examiner is relying on in Mahoney. Accordingly, for at least this reason also, Applicants respectfully submit that Claim 22 is patentable over the Yamashita and Mahoney references. The Examiner respectfully responds by saying that what was intended to be said was that Yamashita and Mahoney relate to generating layouts of documents through the use of models.

Conclusion

26. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James H. Blackwell whose telephone number is 571-272-4089. The examiner can normally be reached on Mon-Fri.

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather R. Herndon can be reached on 571-272-4136. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

James H. Blackwell
09/11/2006

William L. Bashore
WILLIAM BASHORE
PRIMARY EXAMINER